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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/694,926	10/27/2003	Guenter W. Brune	DCI-6CIP1D3	5085

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PRITZKAU PATENT GROUP, LLC
993 GAPTER ROAD
BOULDER, CO 80303

EXAMINER

SMITH, MATTHEW J

ART UNIT PAPER NUMBER

3672

DATE MAILED: 12/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/694,926

Applicant(s)

BRUNE ET AL.

Examiner

Matthew J. Smith

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 November 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-70 is/are pending in the application.
- 4a) Of the above claim(s) 1-24 and 51-70 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 25-50 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-70 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☒ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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The previous Office action is hereby vacated to correct an oversight with respect to the claims pending in this application. A Transmittal letter, filed with the application on 27 October 2003, contained a preliminary amendment. This amendment, however, is considered non-compliant with the current, revised amendment practice, effective 30 July 2003, which requires amendments to have a listing of the claims. Therefore, the preliminary amendment was not entered and thus all claims in the application are still pending. Applicant is encouraged to submit a proper amendment in response to this Office action, i.e., a listing of claims 1-24 and 51-70 with the word "Cancelled" next to each number.

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-24, drawn to a system comprising at least two detectors for tracking and/or guiding a boring tool through the ground, classified in class 175, subclass 45.
- II. Claims 25-50, drawn to a method for determining the position of at least two detectors used with a system for tracking and/or guiding a boring tool through the ground, classified in class 175, subclass 24.
- III. Claims 51-57, drawn to a method using at least two detectors for mapping the intended path of an underground boring tool, classified in class 250, subclass 254.
- IV. Claims 58-60, drawn to a method using an above ground detector to determine the absolute positions of the detector and an underground boring tool, classified in class 340, subclass 686.6.

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- V. Claims 61-70, drawn to a method for guiding an underground boring tool along a selected flux path so as to intersect a plane having a selected pitch orientation at the target location, classified in class 175, subclass 57.

The inventions are distinct, each from the other because of the following reasons:

Inventions Group I. and Groups II.-V. are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the processes of Groups II.-IV. can be monitored by the use of acoustic detectors, which are calibrated to provide distance determinations based on the intensity of the vibrations received. One of ordinary skill can practice the process of Group V. by hand, i.e., by positioning oneself above the path of the underground boring tool and sensing the boring tool vibrations.

Inventions Groups II.-V. are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions of Groups II. and III. have different functions, the former to determine the position of the detectors and the latter to determine the intended path of an underground boring tool. Groups III.-V. differ from each other in that these groups claim at least two detectors, a single detector, or no detector, respectively.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

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During a telephone conversation with Mike Pritzkau on 18 November 2004 a provisional election was made with traverse to prosecute the invention of Group II., claims 25-50. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-24 and 51-70 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Information Disclosure Documents

The information disclosure statement filed with this application contains copies of the Information Disclosure Statement (IDS) filed with one of the parent applications (09-845238). The documents cited have been considered but no copy of the IDS is being mailed since the references are initialed by the examiner of record in the parent (09-845238).

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: Figures 4 and 5, "106" should be -106a-.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for

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consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 25, 28, 29 31-34, 38, 39, and 48-50 are rejected under 35 U.S.C. 102(b) as being anticipated by Waters et al (5230387).

Waters et al disclose a system in which a boring tool 22 is moved through the ground, an arrangement for tracking 20, at least two detectors (col. 12, line 34) that transmit and receive electromagnetic location data within a dipole range or signal strength, an antenna array (col. 20, lines 53-55), three orthogonal antennas (col. 8, line 4), processing (col. 11, line 32), producing two subsets of data (col. 12, lines 48-col. 14, line 9), measurement means 141, and a method of use of including moving detectors to new positions (col. 12, lines 54-58).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 40 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chau et al. (4881083) in view of Waters et al. (5230387).

Chau et al show an above ground receiver for a directional boring system but not two detectors.

Waters et al. disclose the advantages of two detectors and associated analysis in a directional drilling system.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to use two detectors in the Chau et al. directional drilling system, as disclosed by Waters et al., in order to increase accuracy.

Claims 26, 27, and 35-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Waters et al. in view of Flowerdue et al.

Waters et al. disclose two detectors in a directional drilling system but not measuring tilt or pitch.

Flowerdue et al describe measuring tilt and pitch of a boring tool in a directional drilling system to assist in guidance of the boring tool.

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It would have been obvious to a person having ordinary skill in the art at the time the invention was made to measure tilt and pitch of the boring tool, as described by Flowerdue et al. in order to increase accuracy.

Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Waters et al. in view of Robinson et al. (3725777).

Waters et al. disclose two detectors in a directional drilling system but not using a least-square error technique.

Robinson et al. discuss using least squares to fit measured data to calculated data (col. 4, line 8) in a well environment.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to use the least-squares technique, as discussed by Robinson et al., in the Waters et al. system in order to increase accuracy.

Claims 42-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chau et al. in view of Waters et al. as applied to claim 41 above, and further in view of Flowerdue et al.

Chau et al show an above ground receiver for a directional drilling system but not two detectors. Waters et al. disclose the advantages of two detectors in a directional drilling system. The combination presents using two detectors in the Chau et al. directional drilling system, as disclosed by Waters et al. but not measuring tilt.

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Flowerdue et al describe measuring tilt of a boring tool in a directional drilling system to assist in guidance of the boring tool.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to measure tilt, as described by Flowerdue et al., in the combined device in order to increase accuracy.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Smith whose telephone number is 703-305-5135. The examiner can normally be reached on T-F, 9-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David J. Bagnell can be reached on 703-308-2151. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



David Bagnell
Supervisory Patent Examiner
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